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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/509,429

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Ludovic Noirie

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EXAMINER

STAHL, MICHAEL J

ART UNIT

PAPER NUMBER

2874

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Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No. 10/509,429	Applicant(s) NOIRIE ET AL.	
	Examiner Mike Stahl	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 10-12 is/are rejected.
- 7) ☒ Claim(s) 1,3-9 and 11-14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/24/04</u> . | 6) <input type="checkbox"/> Other: ____ |

Claim Objections

Claim 1 is objected to because it has contradictory limitations. Line 7 recites that there are “at most C” space switching modules. However lines 9, 10, and 12 presume that there are exactly C modules. It appears that “C” should be deleted from “C space switching modules” in line 9 and also deleted from “C modules” in each of lines 10 and 12.

Claims 3-6 and 11 are objected to because they similarly refer to “C modules” or “C switching modules”, which is in contradiction to the recitation of “at most C” modules in claim 1. One remedy is similar to what was proposed in the preceding paragraph. Alternatively, claims 3-6 and 11 could be changed to depend from claim 2 which positively recites exactly C modules.

Claim 7 is objected to because it refers to “said P/C switching matrices (G_i)”, but such matrices are not mentioned in parent claim 1. This can be fixed by changing claim 7 to depend from claim 5 or claim 6.

Claim 12 is objected to because its reference to “said N inputs of said N dividers” may suggest that each divider has N inputs, whereas claim 1 states that each divider has only one input. It is suggested that “each of said N inputs of said N dividers” be replaced with “the input of each divider” to clarify the claim.

Claim 13 is objected to because in the last line, “MQWSOPA₁” should be changed to “MQWSOA₁”.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4 and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Shiragaki et al. (US 6115517).

Claim 1: Shiragaki discloses in fig. 5 a space cross-connect unit with N input ports and P output ports, comprising: a broadcast stage with N signal dividers **511-51n** each having one input and C outputs where C is an integer factor of P less than P, each input being connected to one of the N input ports **501-50n** so that each divider divides a signal received at one of the input ports into C signals at the C outputs, and a space switching stage comprising at most C space switching modules (a single module is regarded as including the set of elements **52i-j**, **53i-j** and **54i-j** which are ultimately connected to a common multiplexer **56i** in fig. 5), which cross-connect unit is characterized in that: the C space switching modules are non-blocking and non-broadcasting, and each module has N inputs and P/C outputs, said N inputs are connected to N outputs of the broadcast stage, each of those N outputs comes from a different divider **51i**, and each of the P/C outputs of the modules is connected to a respective one of the P output ports. In terms of the variables used in fig. 5, $N = n$, $P = m \times n$, $C = n$, and $P/C = m$. In this arrangement,

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the output ports are regarded as the collective outputs of the space switching modules identified above, prior to but not including the various elements **55i-j**.

Claim 2: There are exactly N dividers **51i** and C modules.

Claim 3: Each of the C modules includes means for connecting each of its N inputs to one of its P/C outputs.

Claim 4: Each of the C switching modules is a non-blocking switch matrix with N inputs and P/C outputs.

Claim 10: The switching stage uses a technology based on lithium niobate (col. 20 lns. 35-38).

Claim 11: In the fig. 5 arrangement, each of the P/C outputs of the C modules is followed by a wavelength converter **55i-j**, which may be implemented as a semiconductor optical amplifier (col. 20 lns. 60-65).

Claims 1-4 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Doerr et al. (US 6532090).

Claim 1: Doerr discloses in fig. 7 a space cross-connect unit with N input ports and P output ports, comprising: a broadcast stage with N signal dividers **703** each having one input and C outputs where C is an integer factor of P less than P, each input being connected to one of the N input ports **700** so that each divider divides a signal received at one of the input ports into C signals at the C outputs, and a space switching stage comprising at most C space switching modules (two of them are shown as **710** and **711**), which cross-connect unit is characterized in that: the C space switching modules are non-blocking and non-broadcasting (col. 6 lns. 39-40);

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and each module has N inputs and P/C outputs, said N inputs are connected to N outputs of the broadcast stage, each of those N outputs comes from a different divider 703, and each of the P/C outputs of the modules is connected to a respective one of the P output ports. In terms of the variables used in fig. 7, $N = k$, $P = k^2$, $C = k$, and $P/C = k$. In this arrangement, the output ports are regarded as the collective outputs of the space switching modules identified above, prior to but not including the combiners 705.

Claim 2: There are exactly N dividers 703 and C modules.

Claim 3: Each of the C modules includes means for connecting each of its N inputs to one of its P/C outputs.

Claim 4: Each of the C switching modules is a non-blocking switch matrix with N inputs and P/C outputs.

Claim 11: Each of the P/C outputs of the C modules is followed by an amplifier (which is part of 705 – col. 6 lns. 44-45).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiragaki et al. (applied above).

Claim 12: Shiragaki does not show the input of each divider being preceded by an amplifier. It is considered inherent that the signals coming into the device at ports 50i were previously conducted along an optical network. For example, fig. 5 is a component corresponding to 101 of fig. 1, and the complete fig. 1 apparatus is a node in an optical network. It would have been obvious to a skilled person to use an amplifier in the optical network upstream of the Shiragaki fig. 5 device since it is well known that optical transmission lines have non-zero attenuation and since it is desirable to compensate for such attenuation in order to maintain the optical signals at useful strengths.

Allowable Subject Matter

Claims 5-9 and 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and if the pertinent informality objections made above are overcome.

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Claims 5-6 define a specific structure for an individual switching module which is not disclosed or suggested by the references applied to base claim 1. It is assumed that claim 7 will depend from claim 5 or claim 6 after amendment. Claim 9 depends from claim 5.

Claim 8 requires that the number N of input ports is equal to the number P of output ports. With the way the applied references were interpreted, this condition is not satisfied. It is not apparent that the references could be interpreted in such a manner that $N = P$ while still satisfying the condition from base claim 1 that C is less than P.

Claim 13 defines a specific structure for each of the space switching modules which is not described or suggested by the references applied to base claim 1.

Claim 14 requires that M input ports of the cross-connect unit from claim 1 receive M signals from a demultiplexer. The applied references fail to teach or suggest this arrangement since the embodiments relied upon for the rejection receive all of the involved wavelengths at each input port of the cross-connect unit.

Conclusion

The additional references listed on the attached PTO-892 form are considered relevant to the subject matter of this application.


Inquiries about this letter should be directed to Mike Stahl at 571-272-2360. Inquiries of a general or clerical nature (e.g., a request for a missing form or paper, etc.) should be directed to the technical support staff supervisor at 571-272-1626. Official correspondence which is eligible for submission by facsimile and which pertains to this application may be faxed to 571-273-

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8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Questions about the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Stahl
Patent Examiner
Art Unit 2874

April 9, 2006



**SUNG PAK
PRIMARY EXAMINER**